

Seasonal drought prediction in East Africa: Can National Multi-model Ensemble Forecasts Help?

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The increasing food and water demands of East Africa's growing population are stressing the region's inconsistent water resources and rain-fed agriculture. As recently as in 2011 part of this region underwent one of the worst famine events in its history. Timely and skillful drought forecasts at seasonal scale for this region can inform better water and agro-pastoral management decisions, support optimal allocation of the region's water resources, and mitigate socio-economic losses incurred by droughts. However seasonal drought prediction in this region faces several challenges. Lack of skillful seasonal rainfall forecasts; the focus of this presentation, is one of those major challenges.

In the past few decades, major strides have been taken towards improvement of seasonal scale dynamical climate forecasts. The National Centers for Environmental Prediction's (NCEP) National Multi-model Ensemble (NMME) is one such state-of-the-art dynamical climate forecast system. The NMME incorporates climate forecasts from 6+ fully coupled dynamical models resulting in 100+ ensemble member forecasts. Recent studies have indicated that in general NMME offers improvement over forecasts from any single model. However thus far the skill of NMME for forecasting rainfall in a vulnerable region like the East Africa has been unexplored. In this presentation we report findings of a comprehensive analysis that examines the strength and weakness of NMME in forecasting rainfall at seasonal scale in East Africa for all three of the prominent seasons for the region. (i.e. March-April-May, July-August-September and October-November-December). Simultaneously we also describe hybrid approaches; that combine statistical

approaches with NMME forecasts; to improve rainfall forecast skill in the region when raw NMME forecasts lack in skill.